

Electrical Diagnosis & Repair, Part 1

This & the following articles will help you troubleshoot & repair your electrical system.

First, you will need a few things:

A good service manual for your car with wiring diagrams.

A test light

A multimeter

Now a little background. You need to know that all circuits need two things. A power supply & a ground source. Without one or the other, it will not work.

For some definition of terms related to a cars electrical system, check out the glossary of terms.

Here is a five step procedure to help troubleshoot. Follow these & you will make things go smoother.

1.verify the problem

Turn on all the components in the circuit. If reverse lights & tail lights are on the same fuse, but only the tail lights work, you can narrow down your search.

2.analyze the wiring schematic

Look up the diagram for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power source through the circuit components to ground.

Also, trace circuits that share wiring with the problem circuit. Try to operate any shared circuits you may have missed in step one. If shared circuits work, then the shared wiring is ok,& the cause must be in the wiring used by the problem circuit.

If several circuits fail at the same time, the likely cause is either a fuse or ground problem.

3.test the circuit

Make circuit tests to check the diagnosis you made in step 2.keep in mind that a logical, simple procedure is key to efficient troubleshooting. Test for the most likely cause first. Try to make tests at points that are easily accessible.

4.fix the problem

Once the specific problem is id'd, make the repair. Be sure to use proper tools, materials,& procedures.

5.make sure it works

Turn on all components in the repaired circuit to make sure you fixed the entire problem. If the problem was a blown fuse, be sure to test all the circuits on that fuse.

Now for the equipment.

A good, un-powered, test light has a long sharp probe for piercing wiring insulation & probing connectors. It also has a cable with a clip to attach to ground. It also has a light.

Now how to use it. Attach the clip to the negative battery terminal & touch the probe to the positive battery terminal or the main lead on the starter relay. The tester lights up. Use this simple procedure anywhere on the car to check for power.

Now, put the clip on the positive battery terminal & touch the probe to a ground source, i.e. The engine block, firewall, etc. Or the battery negative terminal. The tester lights. Use this procedure to test a ground circuit anywhere on the car.

A voltmeter can also be used to test circuits. It can be either digital or analog, & has two test leads. One is black used on ground, one red used on power. To test for power, put the black lead on a ground, battery negative or engine block & the red on the positive battery terminal. You should read 12.0 volts.

Voltmeters & multimeters vary in design & function & it's impossible to describe how to use them accurately here. Read the manual that comes with the meter you purchase.

- Roger Kizer

